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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,426	11/08/2001	Brad R. Lewis	30014200-1006	6022

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EXAMINER

SHRADER, LAWRENCE J

ART UNIT	PAPER NUMBER
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2193

DATE MAILED: 06/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/010,426

Applicant(s)

LEWIS ET AL.

Examiner

Lawrence Shrader

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 March 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 29 - 56 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 29 - 56 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Original claims 1 – 28 have been cancelled and renumbered claims 29 – 56 to correct a numbering error.
2. Claims 29 – 56 remain rejected. The Applicant's arguments have been fully considered, but are moot in view of the new grounds of rejection.

#### ***Claim Objections***

3. The objection to improper numbering of claims not in accordance with 37 CFR 1.126 has been withdrawn in view of the amendment having renumbered the original claims as 29 – 56.

#### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 29 – 32, 34, 35; 36 – 39, 41; 44 – 50; 51 – 55; and 56 are rejected under 35 U.S.C. 102(e) as being anticipated by Calder et al., U.S. Patent 5, 963,972 (hereinafter referred to as Calder).

**In regard to claim 29:**

*generating a graph that represents the data flow program, the graph comprising nodes corresponding to selected ones of the blocks and arcs corresponding to dependency relationships between the nodes; and*

*receiving an optimization command to manipulate the graph to improve performance of the data flow program.*

Calder discloses generating a graph representing a data flow program comprising nodes representing blocks and arcs representing dependencies between blocks (column 4, lines 10 – 65).

**In regard to claim 30, incorporating the rejection of claim 29:**

*"...further comprising the step of performing the optimization command."*

See Calder column 9, lines 12 – 20.

**In regard to claim 31, incorporating the rejection of claim 30:**

*"...further comprising the step of performing performance analysis on the data flow program in accordance with the optimization command."*

See Calder at column 7, lines 6 – 64.

**In regard to claim 32, incorporating the rejection of claim 29:**

*"...wherein the nodes are placed in an execution queue for processing, and wherein the optimization command specifies re-ordering the nodes in the execution queue."*

Calder discloses a reordering of instructions for execution efficiency (column 1, lines 41 – 58). A queue is implicit in the system.

**In regard to claim 34, incorporating the rejection of claim 29:**

*"...wherein the blocks are assigned data operated on by the data flow program and wherein the optimization command specifies setting revised data for a selected block."*

See Calder column 1, lines 41 – 45.

**In regard to claim 35**, incorporating the rejection of claim 29:

*"...wherein the optimization command specifies a performance comparison between selected nodes."*

See Calder column 1, lines 59 – 66.

**In regard to claim 36**:

*"dividing a memory area into blocks and associating each block with at least a portion of the data and with at least one code segment;"*

*"generating a graph representation of the data flow program, the graph representation comprising nodes associated with the blocks, and arcs associated with dependencies between the blocks; and*

*performing an optimization command to manipulate the graph to improve performance of the data flow program."*

See Calder column 1, lines 41 – 58; column 3, line 56 to column 4, line 8)

**In regard to claim 37**, incorporating the rejection of claim 36:

*"...further comprising the step of performing performance analysis on the data flow program."*

See Calder at column 7, lines 6 – 64.

**In regard to claim 38**, incorporating the rejection of claim 36:

*"...further comprising the step of entering the nodes in a queue for execution, and wherein the optimization command specifies reordering the nodes in the queue."*

Calder discloses a reordering of instructions for execution efficiency (column 1, lines 41 – 58). A queue is implicit in the system.

**In regard to claim 39**, incorporating the rejection of claim 37:

*"...wherein the step of performing performance analysis comprises the step of determining execution time for the data flow program."*

See Calder column 3, line 46 to column 4, line 8.

**In regard to claim 41**, incorporating the rejection of claim 37:

*"...wherein the nodes are characterized by node execution times, and wherein the optimization command specifies a reduced node execution time for one of the nodes, and wherein the step of performing performance analysis comprises the step of determining execution time for the data flow program in accordance with the reduced node execution time."*

See Calder column 3, line 46 to column 4, line 8.

**In regard to claim 44** (a computer-readable medium): It is rejected for the same corresponding reasons put forth in the rejection of claim 36 (a corresponding method).

**In regard to claim 45** (a computer-readable medium), incorporating the rejection of claim 44: It is rejected for the same corresponding reasons put forth in the rejection of claim 37 (a corresponding method).

**In regard to claim 46** (a computer-readable medium), incorporating the rejection of claim 44: It is rejected for the same corresponding reasons put forth in the rejection of claim 38 (a corresponding method).

**In regard to claim 47** (a computer-readable medium), incorporating the rejection of claim 45: It is rejected for the same corresponding reasons put forth in the rejection of claim 39 (a corresponding method).

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**In regard to claim 48** (a computer-readable medium), incorporating the rejection of claim 45: It is rejected for the same corresponding reasons put forth in the rejection of claim 40 (a corresponding method).

**In regard to claim 49** (a computer-readable medium), incorporating the rejection of claim 45: It is rejected for the same corresponding reasons put forth in the rejection of claim 41 (a corresponding method).

**In regard to claim 50** (a computer-readable medium), incorporating the rejection of claim 44: It is rejected for the same corresponding reasons put forth in the rejection of claim 43 (a corresponding method).

**In regard to claim 51** (a system): It is rejected for the same corresponding reasons put forth in the rejection of claim 29 (a corresponding method).

**In regard to claim 52** (a system), incorporating the rejection of claim 51: It is rejected for the same corresponding reasons put forth in the rejection of claim 32 (a corresponding method).

**In regard to claim 53** (a system), incorporating the rejection of claim 51: It is rejected for the same corresponding reasons put forth in the rejection of claim 33 (a corresponding method).

**In regard to claim 54** (a system), incorporating the rejection of claim 51: It is rejected for the same corresponding reasons put forth in the rejection of claim 35 (a corresponding method).

**In regard to claim 55** (a system), incorporating the rejection of claim 51: It is rejected for the same corresponding reasons put forth in the rejection of claim 34 (a corresponding method).

**In regard to claim 56 (a system):** It is rejected for the same corresponding reasons put forth in the rejection of claims 29 and 36 (corresponding methods).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 33, 40, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calder et al., U.S. Patent 5, 963,972 in view of Hamada et al., U.S. Patent 6,493,863 (hereinafter referred to as Hamada).

**In regard to claim 33, incorporating the rejection of claim 29:**

*"...wherein the nodes are characterized by node execution times, and wherein the optimization command specifies setting one of the node execution times, and further comprising the step of simulating execution of the data flow program in accordance with the node execution times."*

Calder discloses generating a graph representing a data flow program comprising nodes representing blocks and arcs representing dependencies between blocks, (column 3, line 46 to column 4, line 8), but does not explicitly disclose nodes characterized by execution times and simulating the data flow program in accordance with the node execution times. However, Hamada discloses application program modules represented in a data flow graph that are simulated and determining the execution timing of each of the modules in a second data flow



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graph (column 2, lines 19 – 45). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the data graph as taught by Calder with the simulation and determination of node (module) execution times as taught by Hamada, because the combination allows greater efficiency by optimizing characteristics with using threshold value inherent to the module as taught by Hamada at column 2, lines 40 – 45.

**In regard to claim 40, incorporating the rejection of claim 37:**

*“...wherein the step of performing performance analysis comprises the step of simulating execution of the nodes in the graph.”*

Calder discloses generating a graph representing a data flow program comprising nodes representing blocks and arcs representing dependencies between blocks (column 3, line 46 to column 4, line 8), but does not explicitly disclose nodes characterized by execution times and simulating the data flow program in accordance with the node execution times. However, Hamada discloses application program modules represented in a data flow graph that are simulated and determining the execution timing of each of the modules in a second data flow graph (column 2, lines 19 – 45). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the data graph as taught by Calder with the simulation and determination of node (module) execution times as taught by Hamada, because the combination allows greater efficiency by optimizing characteristics with using threshold value inherent to the module as taught by Hamada at column 2, lines 40 – 45.

**In regard to claim 43, incorporating the rejection of claim 36:**

*“...wherein the optimization command specifies a modification to at least a portion of the data.”*

Calder discloses generating a graph representing a data flow program comprising nodes representing blocks and arcs representing dependencies between blocks (column 3, line 46 to column 4, line 8), but does not explicitly disclose modification of at least a portion of the data. However, Hamada discloses application program modules, represented in a data flow graph, that are simulated and data is changed repeatedly to achieve optimal threshold values (column 2, lines 19 – 45). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the graph as taught by Calder with the simulation and determination of node (module) data values as taught by Hamada, because the combination allows greater efficiency by optimizing characteristics with using threshold value inherent to the module as taught by Hamada at column 2, lines 40 – 45.

8. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Calder et al., U.S. Patent 5, 963,972 in view of Kahn et al., U.S. Patent 6,662,278 (hereinafter referred to as Kahn).

**In regard to claim 42, incorporating the rejection of claim 37:**

*“...wherein the optimization command specifies a memory bandwidth, and wherein the step of performing performance analysis comprises the step of determining execution time for the data flow program in accordance with the memory bandwidth.”*

Calder discloses generating a graph representing a data flow program comprising nodes representing blocks and arcs representing dependencies between blocks and determining the execution timing of each of the modules (column 3, line 46 to column 4, line 8), but does not explicitly disclose memory bandwidth specification. However, Kahn discloses a memory bandwidth specification for available memory access (Abstract). Therefore, it would have been

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obvious to one skilled in the art at the time the invention was made to modify the data graph as taught by Calder with the simulation and determination of node (module) execution times, because the combination allows greater efficiency by optimizing characteristics with using threshold value, and further modified with the a threshold placed on memory bandwidth as taught by Kahn, because the further modification enhances the code depicted in the data graph of Calder with a threshold of memory accesses per unit of time, as taught by Kahn at column 2, lines 54 – 57, further increasing the efficiency of the optimized code.

### *Conclusion*

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence Shrader whose telephone number is (703) 305-8046. The examiner can normally be reached on M-F 08:00-16:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (703) 305-9662. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lawrence Shrader  
Examiner  
Art Unit 2193

7 June 2005

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